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EMERGENCY FORAGE CROPS.

Reports from many portions of the Central West indicate that the droughts of spring and early summer have greatly reduced the hay crop throughout this entire section, and that in many localities the pastures are already completely dried up. Oats, too, in some sections, are only half a crop. This situation calls for prompt recognition by farmers and the immediate planting of emergency crops to round out the shortage of both hay and pasture. There is still time between now and mid-July to plant half a dozen kinds of quick-growing crops that may be used as substitutes for the regular hay and pasture crops if the seed is secured and the land at once put into condition.

For hay there may be planted millet, cowpeas, sorghum, soy beans, and Canada field peas and barley. These same crops are suitable for pasture purposes, and, in addition, rape, rye, and winter varieties of wheat. The whole corn plant may also be used. For grain, buckwheat, millet, and cowpeas are available, and, in the southern part of the region, early varieties of soy beans.

The aim of this pamphlet is to state briefly enough essential facts relative to each of these crops to enable intelligent selection, giving reference to more complete bulletins on the subject, which may be secured later. The vital point now is the recognition of the situation and the prompt planting with least possible delay of some crop that will supplement the pastures as quickly as possible and fill empty barns with hay for winter.

CROPS THAT MAY BE PLANTED FOR HAY OR PASTURE.

MILLET.

Common millet is one of the best varieties of millet to sow as an emergency hay or pasture crop, since it yields well under trying conditions of soil and climate. It matures for hay in 50 to 80 days from the date of sowing, and for seed 10 to 15 days later. As a pasture, stock can be turned on it within a month after seeding. Use one-half to three-fourths of a bushel of seed per acre. If seeded for an early grain crop or on corn land burned up by drought, disk the land thoroughly and harrow the seed in or sow on shallow plowed land well harrowed down. Other good varieties of millet are Hungarian and German. Millet hay is of most value for cattle. It is less desirable for horses and sheep. Broomcorn or hog millet is one of the best producers of seed. Millet seed is relished by poultry, hogs, and young cattle.¹

¹ See also U. S. Dept. Agr. Farmers' Bulletin No. 101, Millets.

SORGHUM.

For fodder sorghum should be sown as early in July as possible. Early Amber, one of the best varieties, requires 70 to 100 days to mature for fodder, and the Orange varieties about 10 days longer. The crop should be cut for fodder when the seed on about half the head is mature. The yield of sorghum is from 3 to 6 tons of cured forage per acre from one cutting. Sow on well-prepared ground at the rate of $1\frac{1}{2}$ to 2 bushels of seed per acre and harrow the seed in. In some sections cowpeas and sorghum are sown together at the rate of one-half to 1 bushel of cowpeas and 1 bushel of sorghum. This makes better hay or pasture than sorghum alone. As a summer pasture the mixture is especially relished by sheep, cattle, and hogs. Sorghum fodder is of greatest value for cattle, but is also a good roughage for horses and sheep.¹

COWPEAS.

Throughout Indiana and Illinois, especially the southern portions, and the States to the southwest, the early varieties of both cowpeas and soy beans may be successfully sown for hay or pasture as late as July 20. Both crops are equal or superior to clover in feeding value and are relished by every class of stock on the farm. Cowpeas will give from 1 to 3 tons of hay per acre. New Era is one of the earliest varieties, maturing seed in 60 to 80 days after sowing. Other early varieties are Early Blackeye and Michigan Favorite. Whippoorwill, while a little later, is a more vigorous grower and a general favorite for hay or pasture. In Missouri, Kansas, and the southern portion of Illinois and Indiana a cowpea hay crop can be grown after an early grain crop has been removed. New Era is one of the best varieties for this purpose. The most satisfactory results are likely to be secured by seeding on well-prepared ground in rows 27 to 30 inches apart, at the rate of about half a bushel per acre, keeping the rows cultivated. If seeded broadcast at least 1 bushel should be sown and the crop harrowed in. Cowpeas sown in standing corn at the last cultivation will furnish a large amount of pasturage, and this method of handling the crop is recommended.²

SOY BEANS.

This crop is somewhat more productive of seed than cowpeas and is equally as rich in feeding value as that crop. The hay is valuable for dairy cows, brood sows, and young stock. Seed in rows, 24 to 32 inches apart, at the rate of one-half to three-fourths bushel per acre on well-prepared ground and cultivate the crop. Ogemaw is one of the earliest varieties, maturing seed in 70 to 90 days. Extra Early Dwarf and Early Yellow mature in about the same time. Ito San is a medium early variety and a good seed yielder. Hollybrook is still later and a heavy producer of forage.³

BARLEY AND PEAS.

Barley and Canada field peas seeded together at the rate of about 1 bushel of each make an excellent pasture and soiling crop, and if seeded by July 15 will mature for hay. The hay is relished by sheep, horses, and cattle and is a rich protein forage for dairy cows, while the pasture is especially valuable for hogs and lambs. The yield varies from 2 to 3 tons of cured hay per acre and the hay is fully equal in feeding value on the farm to the best mixtures of clover and timothy. Oats are frequently seeded with Canada field peas for forage, but after July barley makes a more rapid growth than oats and is less subject to rust. A mixture of barley and peas may be seeded together with a grain drill on well-prepared, fertile soil, preferably clay loam, or broadcast and harrowed in, covering 2 to 3 inches deep.⁴

RAPE.

This is strictly a succulent pasture crop of especial value for hogs, growing lambs, and fattening sheep. It may be sown in corn at the last cultivation, using about 3 pounds of seed per acre and lightly harrowing it in. Much

¹ See also Farmers' Bulletin No. 246, Saccharine Sorghums for Forage.

² See also U. S. Dept. Agr. Farmers' Bulletin No. 318, Cowpeas; and Kansas Experiment Station Bulletin No. 160, Cowpeas.

³ See also U. S. Dept. Agr. Farmers' Bulletin No. 372, Soy Beans.

⁴ See also U. S. Dept. Agr. Farmers' Bulletin No. 224, Canada Field Peas.

better results will be obtained by seeding the crop alone on fertile clay loam or black soil, sowing either in drills 30 inches apart and at the rate of 2 pounds per acre, or broadcasting at the rate of 3 pounds per acre, covering about half an inch deep. The crop will be ready for pasturage within 50 to 60 days from seeding, and on good soils will furnish 20 to 30 tons of green forage.* An acre of rape on good land will furnish pasture two or three months for about 20 hogs or as many lambs fed light grain rations in addition. Dwarf Essex rape is the variety to grow. Cattle and sheep should be gradually accustomed to rape, and well filled up on other feed before turning in to graze, otherwise they may bloat.¹

BUCKWHEAT.

This is a quick-growing crop, maturing seed in about 70 to 75 days from the time of seeding. It is chiefly valuable as a grain crop for poultry and hogs, though the ground middlings make rich protein feed for dairy cows. For horses the ground grain may constitute about one-third of the grain ration and when so used is considered equal in feeding value to oats. As forage it may be used as a soiling crop for dairy cows, having considerable value for this purpose. Of the three varieties commonly grown—Japanese, Silver Hull, and Common—Japanese has usually given best results and is recommended for the West. Seed 2 to 3 pecks per acre, either in drills or broadcast, covering 2 to 3 inches deep. While buckwheat will do better on poor land than some crops, it gives best results on well-prepared, fertile soil. The crop is easily killed by frost.

RYE.

This crop can be sown in the standing corn at the last cultivation in July and will afford considerable pasturage for all stock. It is often thus sown either alone or mixed with rape for lambs or sheep being fattened for market. If seeded on especially prepared ground the crop will come on much earlier and give considerably more fall feed. Seed at the rate of $1\frac{1}{2}$ bushels per acre. In pasturing cows on rye the change from other feeds to rye should be gradual to avoid possible taint of milk. Winter varieties of wheat if sown at once will also afford a large amount of fall pasture.

CORN.

Every farmer knows the value of corn as a supplement to a pasture crop late in summer, for which purpose it may be used for cattle as soon as it is tasseled out and for hogs as soon as the ears have reached the roasting stage. Not so many realize that an acre of corn stover—the crop left standing after the ears have been taken—is as valuable for feeding to cattle and horses as an acre of timothy hay. Ton for ton, corn stover has nearly the same feeding value as timothy. With a short hay crop, therefore, every effort should be made to carefully handle the corn crop. The feeding value in the stalk and leaves of the corn plant increases up to maturity, but if the stalks are allowed to stand in the field after ripening there is considerable loss. This loss at the Iowa Experiment Station two months after ripening amounted to more than one-half of the value of the stalk.

Investigations show that of the feeding value of corn stover about 27 per cent is in the stalk and leaves above the ear, 26 per cent in the husks, and 47 per cent in the stalk and blades below the ear. When left standing in the field many of the lower leaves dry up and are blown away or beaten down by rains into the ground and lost. Farmers are urged to cut corn for grain as soon as the ears are well dented and a few dry blades appear. Thus handled the maximum feeding value of the crop with reference both to grain and stover will be secured. Put the corn in good-sized shocks and after husking out the ears put a number of shocks together. Large shocks lose less food constituents by weather and fermentation than small shocks. If the stover is put into the barn it must be thoroughly dry to prevent molding. Except for convenience of handling it is not necessary to shred corn stover, as apparently its feeding value is little if any increased thereby. By cutting and shocking the feed value of stover is increased one-third to one-half over what it would be if left standing in the field. With a short hay crop this loss should be obviated by gathering and shocking the corn.

¹ See also U. S. Dept. Agr. Farmers' Bulletin No. 164, Rape as a Forage Crop.

PASTURES.

WHY PASTURES FAIL.

Many pastures fail in midsummer because they are not made right. Too few grasses and clovers are employed in the mixture. In many sections, particularly in the Central West, timothy is the only grass used. This should be supplemented with clovers that mature earlier and again come on later in the season than timothy. Some of the other grasses with different habits of growth and seasons of maturing should also be used in the mixture, thus securing with the clover not only more pasture but a far better quality of pasture.

PASTURE MIXTURES.

Instead of seeding timothy alone the following mixture is suggested, per acre: Timothy, 10 pounds; red clover, 8 pounds; alsike, 2 pounds; orchard grass, 4 pounds; Italian rye grass, 5 pounds; English rye, 4 pounds; meadow fescue, 4 pounds. Such a mixture will give a heavier hay crop and hay of better quality than timothy alone, and when left as pasture will afford a much greater quantity of forage throughout the growing season, besides being earlier. Kentucky bluegrass will usually come into the pasture of its own accord, but can be hastened by seeding about 5 pounds with the mixture mentioned above. If the grasses mentioned above are not available, then a mixture of 12 pounds of timothy, 8 pounds of common red clover, 4 pounds of mammoth clover, and 4 pounds of alsike may be seeded.

The grasses should be seeded in the fall with the winter grain and the clovers in early spring when the frost goes out, or both may be seeded together with the spring grain. If a grass-seed attachment to the grain drill is not available, the seed may be mixed in the proper proportions with the grain in the grain box and allowed to run down the grain tube with the grain.

The timothy and clover will be available for hay the first year after the grain is cut. By the third year a good permanent sod will be secured that, if properly cared for, will improve with age. Such pastures will not produce much feed during periods of intensive drought, but if they have been properly cared for will begin to grow again as soon as rains come. To avoid as much as possible the injury from drought it is essential that pastures be not grazed too closely. There should be a good green cover or "grass mulch" in order to protect the roots from the hot sun. Such a pasture will remain green longer during dry weather and will begin to grow as soon as the drought is broken, thus shortening the period of bare pastures.

However, provision should always be made to supplement the pastures at this season by planting summer forage to tide over.

SUPPLEMENTARY AND SUMMER PASTURES.

An excellent plan in providing against shortage of pastures is to grow each year some of the supplementary crops, such as rye, millet, cowpeas, rape, or sorghum, mentioned above to be used during the dry season. An excellent annual pasture can be made by seeding together in spring $1\frac{1}{2}$ bushels of oats, 30 pounds of sorghum, and 10 pounds of mammoth or common red clover. The oats are ready for pasture in late spring and early summer, the sorghum comes on at its best in the hot midsummer, while the clover gives some fall pasture.

The Farmers' Bulletins referred to in this circular can be obtained free by addressing the Secretary of Agriculture, Washington, D. C. The experiment stations in each of the States covered by this circular have published much additional information on these subjects, which can be obtained, if available, by writing for it.

DAVID A. BRODIE,
Agriculturist.

Approved:

JAMES WILSON,
Secretary.

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